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# SUN-SPOTS AND TERRESTRIAL MAGNETIC STORMS

My attention has been called to a remark in my recent lecture on "Cipher Messages from the Stars" which seems to state too positively that terrestrial magnetic disturbances have their origin in the magnetic fields of sun-spots. It has been known for a long time that a close relationship exists between sun-spot activities and terrestrial magnetic storms. Therefore Hale's discovery of strong magnetic fields in sun-spots naturally suggested that these fields were the sources of the terrestrial magnetic disturbances. However, the determinations of the field strengths, in numerous spots, from the separation of the spectral lines as Zeeman effects showed that the magnetic forces involved were too small to produce at the Earth's distance direct magnetic effects of the order of those observed. The well-known hypothesis that the aurorae are produced by streams of electrically charged particles expelled from the Sun and entrapped by the Earth's magnetic field, seems to offer an explanation of the terrestrial magnetic disturbances, which always accompany auroral displays, as the magnetic effects of moving charges. According to this hypothesis the charged particles would be expelled in greater numbers at the time of great solar activity and hence we should expect a close relationship between the occurrence of sun-spots and terrestrial storms. That these charged particles are present in the Sun is inferred from the existence of magnetic fields in the great solar vortices known as spots.

This point of view has met with some criticism from certain physicists, who have suggested that terrestrial magnetic storms have their origin in electric currents in the upper atmosphere, induced by the sun-spot fields.

While the evidence has generally been regarded as favoring the charged-particle hypothesis, it would appear that the actual manner in which magnetic disturbances on the Earth are produced is not thoroly understood.

J. H. MOORE.

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## THE ANGULAR DIAMETER OF $\alpha$ BOOTIS BY THE INTERFEROMETER

Since the measurement of the diameter of *Betelgeuse* in December, 1920, observations for the determination of stellar diameters have been continued with the 20-foot interferometer attached to the upper end of the 100-inch Hooker reflector.